AD-A266 558



NAVAL WAR COLLEGE
Newport, R.I.

THE IMPACT OF ENVIRONMENTAL PROTECTION ON THE OPERATIONAL COMMANDER'S WARFIGHTING DECISIONS

by

DTIC
ELFCTE
JUL 12 1993
S A D

Shawn B. Morrissey
Commander, U.S. Navy

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

This document has been approved for public release and sale; its distribution is unlimited.

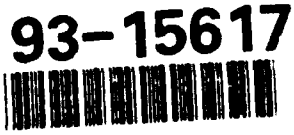
Signature: _____

17 May 1993

Paper directed by
Captain H. Ward Clark, Jr., USN
Chairman, Department of Joint Military Operations

93 7 09 001

93-15617



SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION OPERATIONS DEPARTMENT 6b. OFFICE SYMBOL (If applicable) C	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) NAVAL WAR COLLEGE NEWPORT, R.I. 02841	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
THE IMPACT OF ENVIRONMENTAL PROTECTION ON THE OPERATIONAL COMMANDER'S WARFIGHTING DECISIONS (U)

12. PERSONAL AUTHOR(S)
MORRISSEY, SHAWN BRIAN, CDR, USN

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM _____ TO _____	1993 MAY 17	29

16. SUPPLEMENTARY NOTATION A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
Environmental protection, Damage, Nuclear, Targeting, Herbicides, Hazardous Material, Constraints, Decisions, Environmental awareness, Pollution

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The increasing influence of environmental groups coupled with the public's heightened environmental awareness is placing new constraints on the operational commander's warfighting decisions. Selected environmental agreements are briefly discussed to demonstrate how environmental issues have been evolving. A review of environmental damage from past conflicts is undertaken with a brief focus on the Vietnam and Persian Gulf Wars. Nuclear issues, intelligence and targeting are broadly discussed in the context of their impact on environmental decisions. The main topic is the balance the commander must make between warfighting decisions and potential environmental damage which results from those decisions. Environmental protection is becoming an increasingly important aspect of warfare decisions. The commander and his staff must be prepared to address this issue during future conflicts through use of weapons and target control and proper dissemination of environmental protection guidance in appropriate operations orders and plans.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION	
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL CHAIRMAN, OPERATIONS DEPARTMENT	22b. TELEPHONE (Include Area Code) 841-3414	22c. OFFICE SYMBOL C

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted. All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

★U.S. Government Printing Office 1988—639-013

Abstract of
THE IMPACT OF ENVIRONMENTAL PROTECTION ON THE OPERATIONAL COMMANDER'S WARFIGHTING DECISIONS

The increasing influence of environmental groups coupled with the public's heightened environmental awareness is placing new constraints on the operational commander's warfighting decisions. Some major environmental conventions, conferences and agreements are briefly discussed to show how environmental issues have been developing. A review of the environmental damage of selected past conflicts underscores some of the issues which have contributed to the increased focus placed on attempts to limit environmental damage from warfare. Nuclear contamination issues, intelligence and targeting are broadly discussed to highlight the role they may play in the new balance the commander must make between warfighting decisions and potential environmental damage caused by those decisions. Environmental protection is an increasingly important aspect of warfare decisions. The commander and his staff must be prepared to address this issue during future conflicts through use of weapons and target control and proper dissemination of environmental protection guidance in appropriate operations orders and plans.

DTIC QUALITY INSPECTED 5

Accesion For	
NTIS CRA&I	☑
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and / or Special
A-1	

TABLE OF CONTENTS

CHAPTER		PAGE
ABSTRACT		ii
I	INTRODUCTION	1
II	ENVIRONMENTAL PROTECTION LAWS	3
III	HISTORICAL CASES OF ENVIRONMENTAL DAMAGE DURING CONFLICT	7
IV	THE CHANGING ENVIRONMENTAL ATMOSPHERE	12
V	NUCLEAR CONTAMINATION ISSUES	15
VI	THE IMPORTANCE OF INTELLIGENCE IN MINIMIZING ENVIRONMENTAL DAMAGE DURING CONFLICTS	19
VII	CONCLUSIONS AND RECOMMENDATIONS	21
NOTES		24
BIBLIOGRAPHY		26

THE IMPACT OF ENVIRONMENTAL PROTECTION ON THE OPERATIONAL COMMANDER'S WARFIGHTING DECISIONS

CHAPTER I

INTRODUCTION

Over the last 20 years environmental concerns have increased significantly in both the industrialized and developing world. Concerns over pollution, hazardous materials, hazardous wastes and environmental damage from military operations have gained a much higher level of significance. Environmental laws have become increasingly stricter and environmental organizations have become more vocal and well organized. At the same time warfare has remained an activity which is destructive by nature, typically requires large amounts of materials and products which are potentially threatening to the environment, and has the potential to cause environmental damage on a significant scale. The increase in environmental awareness has resulted in new demands on the military to conduct operations in a manner which requires an increasingly delicate balance between military effectiveness and environmental protection. This delicate balance has placed additional constraints on the operational commander's warfighting decisions. Only through improved recognition and active involvement in addressing this problem can a commander ensure he and his staff will be able to maintain the necessary balance.

The above problem will be addressed by reviewing several critical areas. They include: international and national environmental protection laws and agreements, historical examples of environmental damage from military operations, the changing political atmosphere concerning environmental issues, nuclear contamination issues and the role intelligence must play in avoiding potential environmental disasters from military operations. Finally a recommendation will be provided on how environmental protection can be properly addressed in the operational commander's warfighting decisions and directives.

Chapter II

ENVIRONMENTAL PROTECTION LAWS

Environmental protection laws vary greatly from country to country. Most developed nations have relatively strict laws with respect to the environment. The formulation of environmental law has typically resided in the realm of the individual nations. Enforcement has also been a function reserved for the nations. Some exceptions do exist particularly in the area of formulating environmental laws which have a global impact. Examples of international agreements which concern the protection of the environment include the Antarctic Treaty of 1959, to which the United States is a party, which prohibits "any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons."[1] The 1982 United Nations Convention on the Law of the Sea places restrictions on the discharge of oil at sea.[2] Although the United States is not a party to the Convention the United States has stated agreement with the majority of the provisions within the Convention as being customary and recognized practices of international law; taking only exception with the provisions covering deep seabed mining. Another international agreement concerning the environment is the Environmental Modification Convention of 1977 (ENMOD).[3] ENMOD states in part,

"Recognizing that scientific and technical advances may open new possibilities with respect to modification of the environment...that military or hostile use of such techniques may have effects extremely harmful to human welfare, desiring to prohibit effectively military or any other hostile use of environmental modification techniques in order to eliminate the dangers to mankind..."[4] Article II of the Treaty states, "The term 'environmental modification techniques' refers to any technique for changing - through the deliberate manipulation of natural processes - the dynamics, composition or structure of the earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space."[5] The United States became a party to the ENMOD Convention in 1980.

Another international agreement created to limit environmental damage as a result of war was Protocol I to the Geneva Conventions of 1949. Article 35, Section 3 of the Protocol states, "It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment."[6] Article 56 of the Protocol deals specifically with the "protection of works and installations containing dangerous forces." These include dams, dikes and nuclear generating stations.[7] The U.S. is not a party to the Protocol due to concerns that it would effect or prohibit the use of nuclear weapons.[8]

The above agreements provide a brief look at the increasing importance protection of the environment is taking in the international community. Another example is the "Rio Conference" recently held in Rio de Janeiro, Brazil. The conference, which was sponsored by the United Nations, was a global environmental conference which was attended by a number of heads of states. The significant media attention focused on the conference highlighted the new level environmental issues have gained in the world agenda.

The various national laws dealing with the protection of the environment are often complex, lengthy and vary greatly from country to country. They will not be discussed in this paper other than to point out the U.S. Government policy that federal installations and units will adhere to the environmental laws of the U.S. and the laws of the states in which they are located. Federal installations and personnel will not be immune from prosecution for the violation of any of the environmental laws which apply to the location of the unit. An example of the many environmental laws the military has to contend with are the Clean Air Act, Clean Water Act, Endangered Species Act, The Resources Conservation and Recovery Act and the National Environmental Policy Act. These laws apply in peacetime as well as wartime.

In overseas areas the policy is that U.S. installations will comply with the stricter of U.S. or host nation environmental laws. This stricter environmental compliance

policy will undoubtedly impact on operations particularly in the logistical arena which is heavily regulated with respect to the shipment and movement of hazardous materials.

The operational commander and his staff will need to be aware of the restrictions some of the myriad of constantly changing environmental laws will have on their execution of operations.

Most environmental protection laws make little or no distinction between peacetime and wartime conditions; although some do discuss military necessity as a consideration in compliance.[9] During the 1991 Persian Gulf War the environmental protection regulations with respect to assessment of the impact of Pentagon projects on the environment were waived in the U.S.[10] The agreement to waive the requirements was reached to allow the Pentagon to expedite several projects considered vital to the war effort including an increase in the number of flights from Westover Air Force Base in Massachusetts and the testing of new land mine detection and detonation techniques at a base located in the west.[11]

CHAPTER III

HISTORICAL CASES OF ENVIRONMENTAL DAMAGE DURING CONFLICT

A brief look at pictures from past wars will reveal the significant environmental damage that modern warfare is capable of creating. The trench warfare of World War I resulted in a significant stretch of the French countryside which was devoid of vegetation. During World War II tankers proved to be prime targets among the hundreds of ships sunk in both the Atlantic and Pacific. Deserts were crisscrossed with thousands of tank and other vehicle tracks, lagoons and ports often became the resting places for sunken vessels, hillsides were denuded by naval gunfire and bombardment by aircraft. These and countless other forms of environmental damage were the expected results of warfare. Little thought was given to the environmental damage being created by direct and indirect operations in support of the war effort. The focus was on the defeat of the enemy and environmental damage was considered an unavoidable side effect of the fighting. Commanders worried little about the long-term effects on the environment that their operations would have. Near the end of the war in Vietnam a change in attitude with respect to the impact of warfare on the environment began to emerge. Following the war several environmental concerns were raised and a number of research programs were initiated to assess the environmental impact of the extensive defoliation campaign which had been

carried out during the war. During testimony by Rear Admiral William E. Lemons of the Policy, Plans and National Security Council Affairs Office of the Assistant Secretary of Defence for International Security Affairs to the House Committee on Foreign Affairs' Subcommittee on National Security Policy and Scientific Developments hearings on herbicide operations during the Vietnam War the following information about the operation was presented:[1]

> ARVN corps commanders and their U.S. corps senior advisors were delegated authority to approve small scale defoliation by ground based spray and helicopters. Large scale operations by C-123 aircraft or crop destruction missions were forwarded up through a lengthy administrative chain during which an analysis of the military worth of the project was made. If the mission appeared valid it was forwarded to the U.S. Ambassador and Commander, U.S. Military Assistance Command, Vietnam (COMUSMACV) for approval.

The Admiral also listed some specific uses of the herbicides which included: defoliation of base perimeters, defoliation of lines of communication, defoliation of infiltration routes, defoliation of enemy base camps and crop destruction.[2] In 1968 COMUSMACV personally reviewed the program to ensure it was militarily effective.[3] Comments concerning the effectiveness of the program included, "The herbicide program in terms of effects produced has required an unusually small investment of military effort."[4] The military usefulness of the herbicide program was undisputed, however, the extent of the herbicide program is revealed in the following statement by Dr. Arthur W. Galston of Yale University, "Since 1962 about four million acres of Vietnam have been sprayed with about 100

million pounds of assorted herbicides. This is an area about the size of Massachusetts." Ecologists estimated that of this four million acres 100,000 were of mangrove areas along the Saigon River and that a single spraying of defoliants was sufficient to kill the mangrove trees. They estimated that it would require 20-25 years for the mangroves to recover.[5] These 100,000 acres of mangrove forests represented about 54 percent of the mangrove forests in Vietnam.[6]

In addition to the extensive herbicide program a tremendous amount of ordnance was dropped or fired throughout the country. Approximately 2.8 million tons of bombs were dropped creating millions of craters. Many of these craters still exist 20 years after the end of the conflict.[7] Bulldozers, tanks, trucks, fuel dumps, waste dumps, artillery, hazardous wastes, etc... all contributed to the long-term environmental impact the war would have on the country.

The 1991 U.S. led Persian Gulf War with Iraq provides another example of the significant environmental damage potential of warfare. During this conflict Saddam Hussein catapulted "environmental warfare" onto the world stage and gave considerable legitimacy to the increasingly vocal and well organized environmental groups claims that warfare, no matter how or where it was waged, posed a significant hazard to not only the environment of the theater of operations but to the global environment as well.

During a Strategic Outreach Conference conducted by the Strategic Studies Institute at the U.S. Army War College the following statement was made: "Some military sociologists have argued that modern, industrial society has developed to such an extent that it is fundamentally 'incompatible' with war.'[8]

The Persian Gulf War certainly caused significant environmental damage and much of it was intentional on the part of Iraq. By the end of the war over 700 Kuwaiti oil wells had been set afire or damaged. Oil gushed onto the desert sands creating pools or even lakes of oil. Burning wells sent clouds of black smoke billowing into the atmosphere. It is estimated that six million barrels per day were being burned.[9] The intentional release of millions of barrels of oil from the Sea Island terminal in Kuwait caused a massive oil slick and contamination of the Gulf. The military objective sought by Iraq was the contamination of the Saudi desalinization plants located along the gulf coast of the country. Additionally it would make seaborne operations along the affected coastal areas extremely difficult. The environmental effect of the action was not a factor in the decision. This points out the problems that may develop when militarily beneficial operations are conducted without a proper balance of environmental input.

Both the Vietnam War and the Persian Gulf War advanced the worlds concern over environmental damage as a result of conflict. Just as environmental concerns from Vietnam had

spawned the 1972 Stockholm Conference on the Human Environment, which led to the two Geneva protocols of 1977 (ENMOD and Protocol I),[10] the Gulf War gave rise to the London Conference to propose a new convention on the protection of the environment in time of armed conflict, and the Ottawa Conference on "The use of the environment as a tool of conventional warfare."[11] Where these may eventually lead is yet to be determined.

CHAPTER IV

THE CHANGING ENVIRONMENTAL ATMOSPHERE

There is little doubt that the environment and environmental groups have gained in legitimacy and influence in recent years. Environmentalists, who had for many years been viewed as being somewhat eccentric individuals outside the mainstream of modern society, have over the last 20 years become viewed as concerned and respectable citizens who are at the forefront of a critical and long overdue campaign to protect our planet from the ravages of modern society. They have raised environmental awareness and concern to a new level. The degree of concern that the public now has over environmental issues is obvious from the large number of recycling programs, "Save the Bay" campaigns, Earth Day events, children's cartoons with environmental themes and countless other programs aimed at protecting and improving the environment. Former President Bush proclaimed his commitment to the environment and our current Vice President, Al Gore, is a well known environmental supporter and author of Earth in the Balance which is a book on environmental responsibility.

It is critical that the operational level commander be cognizant of the increasingly critical review his forces and plans will receive. The following statement from the previously mentioned Strategic Studies Institute conference on environmental considerations highlights the issue: "Might the

impact of 'environmental warfare,' such as practiced by Iraq, outweigh the ecological impact? Gulf War photos of oil wells burning and oil slicks had tremendous impact on public opinion, especially in Europe. Indeed they may have had more impact than the photos of dead bodies."[1] The report went on to state, "To the degree environmental issues become paramount in public concern, and war is seen as an environmental disaster, developing and sustaining support for military action becomes more difficult."[2]

In the environmental arena increasing public awareness is directly related to increasing public concern. Military operations (at least those of legitimate governments) have usually been held to certain standards. These standards were normally those perceived within the international community as being the moral and just way to conduct warfare. As technology has allowed for an expanded battlefield and the development of weapons of increasingly destructive power more constraints have been placed on warfighting. This is evidenced by the Geneva Conventions conducted immediately after the Second World War. The Conventions were implemented in an effort to constrain government and military leaders in the actions they took which might adversely effect noncombatants. These were only a follow on to the treaties concerning the use of poisonous gasses which had been implemented after World War I. This evolutionary process of placing increasingly stricter controls on warfare can be

expected to continue and will undoubtedly continue to expand into the realm of the environmental impact warfare has. Just as a commander would be negligent in overlooking the many humanitarian limitations placed on warfighting the modern commander would be ill advised to overlook the environmental aspects as well. Public support and opinion, and increasing vigilance by environmental organizations, will demand that commanders consider the environmental impact of their plans and orders if they desire to avoid possible public censure and loss of support.

CHAPTER V

NUCLEAR CONTAMINATION ISSUES

The island of Bikini looks like a tropical paradise; palm trees sway in the warm tropical breeze, the azure blue sea sparkles under the sun and the clear blue sky is broken only by scattered clouds. However, the island is still uninhabitable almost 50 years after a series of nuclear weapons tests were conducted in its lagoon following World War II. Millions of dollars and manyears have been spent on the clean up and hopefully soon the dwindling number of natives born on the island will be able to return to their homes. The long-term environmental impact of the tests is unquestionable.

More recently the disaster at the nuclear power plant located at Chernobyl in the former Soviet Union contaminated an extensive amount of the countryside. Airborne contamination threatened areas of Scandinavia and Eastern Europe. Several years prior to the Chernobyl disaster operators at the Three Mile Island nuclear power plant located in Pennsylvania almost created an accident which could have resulted in the release of large amounts of contamination.

Probably no single item of military technology is more misunderstood than nuclear power and nuclear weapons. The mere mention of nuclear power will normally raise concern amongst environmentalists and the public alike. Even the

peaceful use of nuclear power for electrical generation is a topic of tremendous concern and fear.

Nuclear power gives warships several significant advantages. Nuclear vessels can steam at full speed for an almost limitless period of time thereby allowing them to rapidly proceed to potential trouble spots. Submarines can stay submerged for months; limited only by the amount of provisions they can carry and the endurance of the crew. However there are several disadvantages to nuclear propulsion including the high initial costs, expensive overhauls, and the requirements for extensive specialized training. Another disadvantage is the perceived threat that the loss of a nuclear powered ship would have on the environment. As the Navy is forced to concentrate more on the littoral regions of the globe as a result of the new mission promulgated in "...From the Sea" the hazards of ships being lost near coastal areas will increase. The loss of any vessel during a conflict would provide considerable embarrassment to the U.S. from a prestige point. However, the loss of a nuclear powered warship would compound the problem by adding the tremendous concerns that worries of radiation leakage would raise.

The various Persian Gulf experiences of the USS Stark, USS Samual B. Roberts, USS Princeton, and USS Tripoli, demonstrate the potential to seriously damage or even sink ships that modern weapons have given to many small and less

developed nations. It is not difficult to imagine the public relations impact the damage or sinking of a nuclear powered vessel would have. Environmental concerns would be tremendous. Even if a nuclear powered vessel were not sunk, but only seriously damaged, the problems could be substantial. Concerns over nuclear leakage and contamination might result in countries refusing to allow the vessel to enter port for critical repairs needed to make the vessel seaworthy enough to steam or be towed back to the U.S. for repairs.

These issues are not raised to question the validity of nuclear propulsion. They are raised to point out some of the potential environmental concerns a commander might face in deciding on what forces to use and where to use them or possibly where not to use them based on potential environmental concerns.

What about attacks on nuclear facilities ashore? International law does not prohibit such attacks. Protocol I which was signed by the U.S. in 1977, but not ratified by the U.S., states in article 56, "Works or installations containing dangerous forces...nuclear electrical generating stations, shall not be made the object of attack, unless these objects are military objectives, if such attack may cause the release of major forces..."[1] If a nuclear facility is determined to be a valid military objective then what other considerations must the commander make concerning the decision to attack the target or not? Obviously the potential environmental impact

that the release of radiation would cause must be a primary concern. Environmental considerations will not be the only concerns. The special considerations a country may place on its nuclear facilities must be considered. What if a country considered an attack on its nuclear facilities as a first use of weapons of mass destruction and stated its intentions to respond accordingly? Current Russian policy is to consider any attack on its "dirty" nuclear power facilities a first use of nuclear weapons. This policy is not based on any military consideration for the importance of the facilities it is based on the projections of the environmental damage that would result from such an attack.

CHAPTER VI

THE IMPORTANCE OF INTELLIGENCE IN MINIMIZING ENVIRONMENTAL DAMAGE DURING CONFLICTS

With the increasing demand for the minimization of casualties and environmental damage during conflict intelligence and targeting have taken on increased importance. It is obviously difficult to avoid collateral damage if there is insufficient data to distinguish targets with a military function from those of a non-military nature. if there is a risk of collateral damage then the information needs to be sufficient to allow the commander to evaluate the risk and make an informed decision of whether to go or not. At the operational level of war these decisions will typically be made with respect to targets which might have a significant potential to cause serious damage to the environment. Examples are nuclear facilities, chemical and biological plants, significant infrastructure items such as dams and waste treatment facilities, and petroleum storage and transport facilities.

From an intelligence standpoint the most difficult challenges will be faced during unanticipated operations in areas with little or no previous perceived threat and therefore possibly only marginal previous intelligence. Intelligence to assess the potential for environmental damage may be extremely difficult in the area of dual use facilities

where the military mission of the facility is mostly concealed. Imagine the public relations impact of an attack on a suspected chemical plant which causes the release of chemicals into a nearby river causing significant contamination and death of wildlife. What if the target had been a petroleum plant and the oil spill had not only contaminated the target country but other countries downriver? Intelligence and environmental specialists will need to work hand in hand in solving the problem of potential environmental damage. The environmental specialists would list the information they require to make a proper assessment of the environmental effects and the intelligence specialists would attempt to gather the information. additionally the environmental specialists might analyze available intelligence data to determine if unanticipated environmental risks exists, and if so, to what extent.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

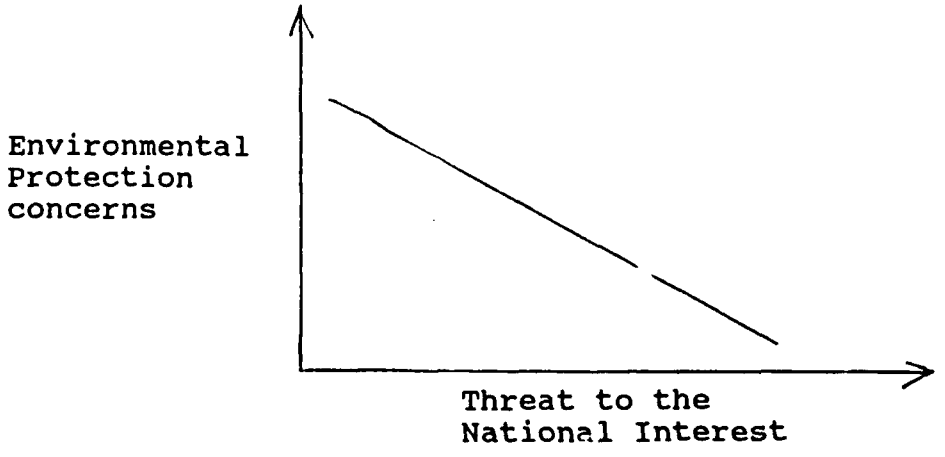
The increase in environmental awareness during the last 20 years has placed new constraints on the warfighting decisions of the commander. Just as minimizing casualties has become a critical mission objective in almost every operation it can be expected that environmental concerns will eventually gain the same importance. It is not inconceivable to imagine guidance from the National Command Authority which includes protection of the environment as one of the objectives.

Environmental groups will continue to grow more well organized, funded and vocal within both the domestic and international arenas. The general public in developed countries, and to a lesser extent in developing countries, will continue to become more receptive to environmental issues raised by these groups. This will be occurring at a time that the general public as a whole is becoming more environmentally aware. There is no reason to believe that the military will not be asked to lead the way in this area just as it has in many other areas that have not directly affected the warfighting potential of the force but have been viewed as being socially important.

How will the commander address the challenges and constraints fighting an environmentally friendly war will raise? First and foremost he must not lose sight of the fact

that the ultimate aim of warfighting is to end the conflict on terms acceptable to the United States. He must ensure that his staff and subordinates understand his position with respect to environmental damage and the constraints the position will place on weapons selection, targets and operations. Weapons or targets that have the potential to cause significant environmental damage may need to be maintained under his direct control. This will of course depend on the specific nature of the conflict.

It can be expected that the degree of environmental constraints placed on the commander will be directly related to the perceived threat of the conflict to the nations interests. Conflicts in which there is little perceived national interest may find almost any level of environmental damage unacceptable. As the threat to the nations interests increases the concerns over protecting the environment will decrease. A graphic presentation of this is:



The environmental constraints will in most cases be proportional to the level of the conflict. As the level of the conflict moves up in the spectrum environmental concerns will probably move inversely.

By placing a statement or annex in his operational plans or orders he can ensure that environmental protection is considered during the operation. This guidance should in addition to the items discussed above contain some guidance on actions to be taken in case of significant environmental damage and list assets available and priorities assigned to clean up efforts.

The commander will need to rely on some of the specialists on his staff who have experience in environmental protection issues. This is an area in which Coast Guard personnel are well suited. If necessary outside specialists must be consulted.

Ultimately it will be the responsibility of the commander to ensure that the proper balance is maintained between environmental protection constraints and mission accomplishment. Ignoring the environmental impacts of his operations will only be done with increasing peril in the future.

NOTES

Chapter II

1. U.S. Navy Dept., The Commander's Handbook on the Law of Naval Operations, NWP9 (Rev. A) (Washington DC: 1989), p. 2-7.

2. A. Bernaerts, Bernaerts Guide to the Law of the Sea (Coulsdon, England: Fairplay, 1988), p.

3. Ecological Consequences of the Second Indochina War (Stockholm: SIPRI, 1976) p. 93-98.

4. Ibid.

5. Ibid.

6. Ibid., p. 99-103.

7. Ibid.

8. N. Ronzitti, The Law of Naval Warfare (Dordrecht: Martinus Nijhoff, 1988) p. 696.

9. Keith Schneider, "Environmental Rule is Waived for Pentagon," The New York Times, 30 January 1991, p. A14.

10. Ibid.

11. Ibid.

Chapter III

1. T. Whiteside, Defoliation (New York: Ballantine, 1970), p. 87-93.

2. Ibid.

3. Ibid.

4. Ibid.

5. Ibid., p. 107-108.

6. Ibid., p. 109.

7. G. Plant, Environmental Protection and the Law of War (London: Belhaven, 1992) p. 69.

8. D. Eyre, ed., The Army: Geostrategic Concerns and Environmental Considerations a Conference Report, U.S. Army War College, (Strategic Studies Institute, 1992) p. 8.

9. Plant, p. 70.

10. Ibid., p. 78.

Chapter IV

1. Eyre, p. 8.

2. Ibid.

Chapter V

1. Ecological Consequences of the Second Indochina War, p. 93-98.

BIBLIOGRAPHY

Bernaerts, Arnd. Bernaerts Guide to the Law of the Sea. Coulsdon, England: Fairplay Publications, 1988.

Ebbin, Steven and Kasper, Raphael. Citizens Groups and the Nuclear Power Controversy. Cambridge, MA: MIT Press, 1974.

Ehrlich, Anne and Birks, John, ed. Hidden Dangers: Environmental Consequences of Preparing for War. San Francisco: Sierra Club Books, 1990.

Ecological Consequences of the Second Indochina War. Stockholm: Stockholm International Peace Research Institute, 1976.

Klessig, Lowell and Strite, Victor. The ELF Odyssey: National Security Versus Environmental Protection. Boulder: Westview Press, 1980.

Morrell, James. The Law of the Sea: An Historical Analysis of the 1982 Treaty and its Rejection by the U.S. Jefferson, NC: McFarland, 1992.

Plant, Glen, ed. Environmental Protection and the Law of War. London: Belhaven Press, 1992.

Ronzitti, N. The Law of Naval Warfare. Dordrect, The Netherlands: Martinus Nijhoff, 1988.

U.S. Navy Dept., The Commander's Handbook on the Law of Naval Operations. NWP9 (Rev. A)

Whiteside, Thomas. Defoliation. New York: Ballantine Books, 1970.